



FLWEMS Paramedic Medication Information For:
MIDAZOLAM HYDROCHLORIDE
(Versed)

(my-**DAYZ**-oh-lam)

Pregnancy Category: D Versed (C-IV) (Rx)

Classification

Benzodiazepine sedative; adjunct to general anesthesia

See Also

See also *Tranquilizers, Antimanic Drugs, and Hypnotics.*

Action/Kinetics

Short-acting benzodiazepine with sedative-general anesthetic properties. Depresses the response of the respiratory system to carbon dioxide stimulation, which is more pronounced in clients with COPD. Possible mild to moderate decreases in CO, mean arterial BP, SV, and systemic vascular resistance. HR may rise somewhat in those with slow HRs (< 65/min) and decrease in others (especially those with HRs more than 85/min). Onset, IM: 15 min; IV: 2-2.5 min for induction (if combined with a preanesthetic narcotic, induction is about 1.5 min). If preanesthetic medication (morphine) is given, the Peak plasma levels, IM: 45 min. Maximum effect: 30-60 min. Time to recovery: Usually within 2 hr, although up to 6 hr may be required. About 97% bound to plasma protein. t_{1/2}, elimination: 1.2-12.3 hr. Rapidly metabolized in the liver to inactive compounds; excreted through the urine.

Uses

IV, IM: Preoperative sedation, anxiolysis, and amnesia. IV: Sedation, anxiolysis, and amnesia prior to or during short diagnostic, therapeutic, or endoscopic procedures (either alone or with other CNS depressants). Induction of general anesthesia before administration of other anesthetics. Supplement to nitrous oxide and oxygen in balanced anesthesia. Sedation of intubated and mechanically ventilated clients as a component of anesthesia or during treatment in a critical care setting. PO: In children to help alleviate anxiety before a diagnostic or therapeutic procedure or before anesthesia induction. Also to reduce ability to recall events that occurred during sedation. *Investigational:* Treat epileptic seizures. Alternative to terminate refractory status epilepticus.

Contraindications

Hypersensitivity to benzodiazepines. Acute narrow-angle glaucoma. Use in obstetrics, coma, shock, or acute alcohol intoxication where VS are depressed. IA injection.

Special Concerns

Use with caution during lactation. Pediatric clients may require higher doses than adults. Hypotension may be more common in conscious sedated clients who have received a preanesthetic narcotic. Geriatric and debilitated clients require lower doses to induce anesthesia and they are more prone to side effects. Use IV with extreme caution in severe fluid or electrolyte disturbances.

Side Effects

Fluctuations in VS, including decreased respiratory rate and tidal volume, apnea, variations in BP and pulse rate are common. The following are general side effects regardless of the route of administration. CV: Hypotension, cardiac arrest. CNS: Oversedation, headache, drowsiness, grogginess, confusion, retrograde amnesia, euphoria, nervousness, agitation, anxiety, argumentativeness, restlessness, emergence delirium, increased time for emergence, dreaming during emergence, nightmares, insomnia, tonic-clonic movements, ataxia, muscle tremor, involuntary or athetoid movements, dizziness, dysphoria, dysphonia, slurred speech, paresthesia. GI: Hiccoughs, N&V, acid taste, retching, excessive salivation. *Ophthalmologic:* Double vision, blurred vision, nystagmus, pinpoint pupils, visual disturbances, cyclic eyelid movements, difficulty in focusing. *Dermatologic:* Hives, swelling or feeling of burning, warmth or cold feeling at injection site, hive-like wheal at injection site, pruritus, rash. *Miscellaneous:* Blocked ears, loss of balance, chills, weakness, faint feeling, lethargy, yawning, toothache, hematoma. More common following IM use: Pain at injection site, headache, induration and redness, muscle stiffness. More common following IV use: *Respiratory:* Bronchospasm coughing, dyspnea, laryngospasm, hyperventilation, shallow respirations, tachypnea, airway obstruction, wheezing, respiratory depression and

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respiratory arrest when used for conscious sedation. CV: PVCs, bigeminy, bradycardia, tachycardia, vasovagal episode, nodal rhythm. *At injection site*: Tenderness, pain, redness, induration, phlebitis.

Drug Interactions

Alcohol / ↑ Risk of apnea, airway obstruction, desaturation or hypoventilation *Anesthetics, inhalation* / ↓ Dose if midazolam used as an induction agent *Antifungals, azole* / ↑ Effect of midazolam R/T ↓ liver metabolism *Clarithromycin* / ↑ Effect of midazolam R/T ↓ liver metabolism *CNS Depressants* / ↑ Risk of apnea, airway obstruction, desaturation or hypoventilation *Droperidol* / ↑ Hypnotic effect of midazolam when used as a premedication *Erythromycin* / ↑ Effect of midazolam R/T ↓ liver metabolism *Fentanyl* / ↑ Hypnotic effect of midazolam when used as a premedication *Indinavir* / Possible prolonged sedation and respiratory depression *Meperidine* / See *Narcotics*; also, ↑ Risk of hypotension *Narcotics* / ↑ Hypnotic effect of midazolam when used as premedications *Propofol* / ↑ Effect of propofol *Protease inhibitors* / ↑ Effect of midazolam R/T ↓ liver metabolism *Ritonavir* / Possible prolonged sedation and respiratory depression *Selective serotonin reuptake inhibitors* / ↑ Effect of midazolam R/T ↓ liver metabolism *Thiopental* / ↓ Dose if midazolam used as an induction agent

How Supplied

Injection: 1 mg/mL, 5 mg/mL; *Syrup*: 2 mg/mL

Dosage

•IM *Preoperative sedation, anxiolysis, amnesia.*

Adults: 0.07-0.08 mg/kg IM (average: 5 mg) 1 hr before surgery. Children: 0.1-0.15 mg/kg (up to 0.5 mg/kg may be needed for more anxious clients).

•IV *Conscious sedation, anxiolysis, amnesia for endoscopic or CV procedures in healthy adults less than 60 years of age.*

Using the 1 mg/mL (can be diluted with 0.9% sodium chloride or D5W) product, titrate slowly to the desired effect (usually slurred speech); initial dose should be no higher than 2.5 mg IV (may be as low as 1 mg IV) within a 2-min period; wait an additional 2 min to evaluate the sedative effect. If additional sedation is necessary, give small increments waiting an additional 2 min or more after each increment to evaluate the effect. Total doses greater than 5 mg are usually not required. Children: Dosage must be individualized by the physician.

Conscious sedation for endoscopic or CV procedures in debilitated or chronically ill clients or clients aged 60 or over.

Slowly titrate to the desired effect using no more than 1.5 mg initially IV (may be as little as 1 mg IV) given over a 2-min period; wait an additional 2 min or more to evaluate the effect. If additional sedation is needed, no more than 1 mg should be given over 2 min; wait an additional 2 min or more after each increment in dose. Total doses greater than 3.5 mg are usually not needed.

Induction of general anesthesia, before use of other general anesthetics, in unmedicated clients.

Adults, unmedicated clients up to 55 years of age, IV, initial: 0.3-0.35 mg/kg given over 20-30 sec, waiting 2 min for effects to occur. If needed, increments of about 25% of the initial dose can be used to complete induction; or, induction can be completed using a volatile liquid anesthetic. Up to 0.6 mg/kg may be used but recovery will be prolonged. Adults, unmedicated clients over 55 years of age who are good risk surgical clients, initial IV: 0.15-0.3 mg/kg given over 20-30 sec. Adults, unmedicated clients over 55 years of age with severe systemic disease or debilitation, initial IV: 0.15-0.25 mg/kg given over 20-30 sec. Pediatric: 0.05-0.2 mg/kg IV.

Induction of general anesthesia, before use of other general anesthetics, in medicated clients.

Adults, premedicated clients up to 55 years of age, IV, initial: 0.15-0.35 mg/kg. If less than 55 years of age, 0.25 mg/kg may be given over 20-30 sec, allowing 2 min for effect. Adults, premedicated clients over 55 years of age who are good risk surgical clients, initial, IV: 0.2 mg/kg. Adults, premedicated clients over 55 years of age with severe systemic disease or debilitation, initial, IV: 0.15 mg/kg may be sufficient.

Maintenance of balanced anesthesia for short surgical procedures.

IV: Incremental injections about 25% of the dose used for induction when signs indicate anesthesia is lightening.

NOTE: Narcotic preanesthetic medication may include fentanyl, 1.5-2 mcg/kg IV 5 min before induction; morphine, up to 0.15 mg/kg IM; meperidine, up to 1 mg/kg IM; or, Innovar, 0.02 mL/kg IM. Sedative

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preanesthetic medication may include secobarbital sodium, 200 mg PO or hydroxyzine pamoate, 100 mg PO. Except for fentanyl, give all preanesthetic medications 1 hr prior to midazolam. Always individualize doses.

END OF INFORMATION – NOTHING FOLLOWS